



Angular Fundamentals

Module 1 - Inleiding



Peter Kassenaar
info@kassenaar.com

Peter Kassenaar

- Trainer, author, developer – since 1996
- Specialty: *"Everything JavaScript"*
- JavaScript, ES6, Angular, NodeJS, TypeScript, React, Vue, Phonegap

www.kassenaar.com

info@kassenaar.com

Twitter: [@PeterKassenaar](https://twitter.com/PeterKassenaar)



ING

OHRA

euricom
A DIMENSION DATA COMPANY

s a n o m a

delta lloyd

zenito
BETERE ZEKERHEID
VOOR ONDERNEMERS

Atos

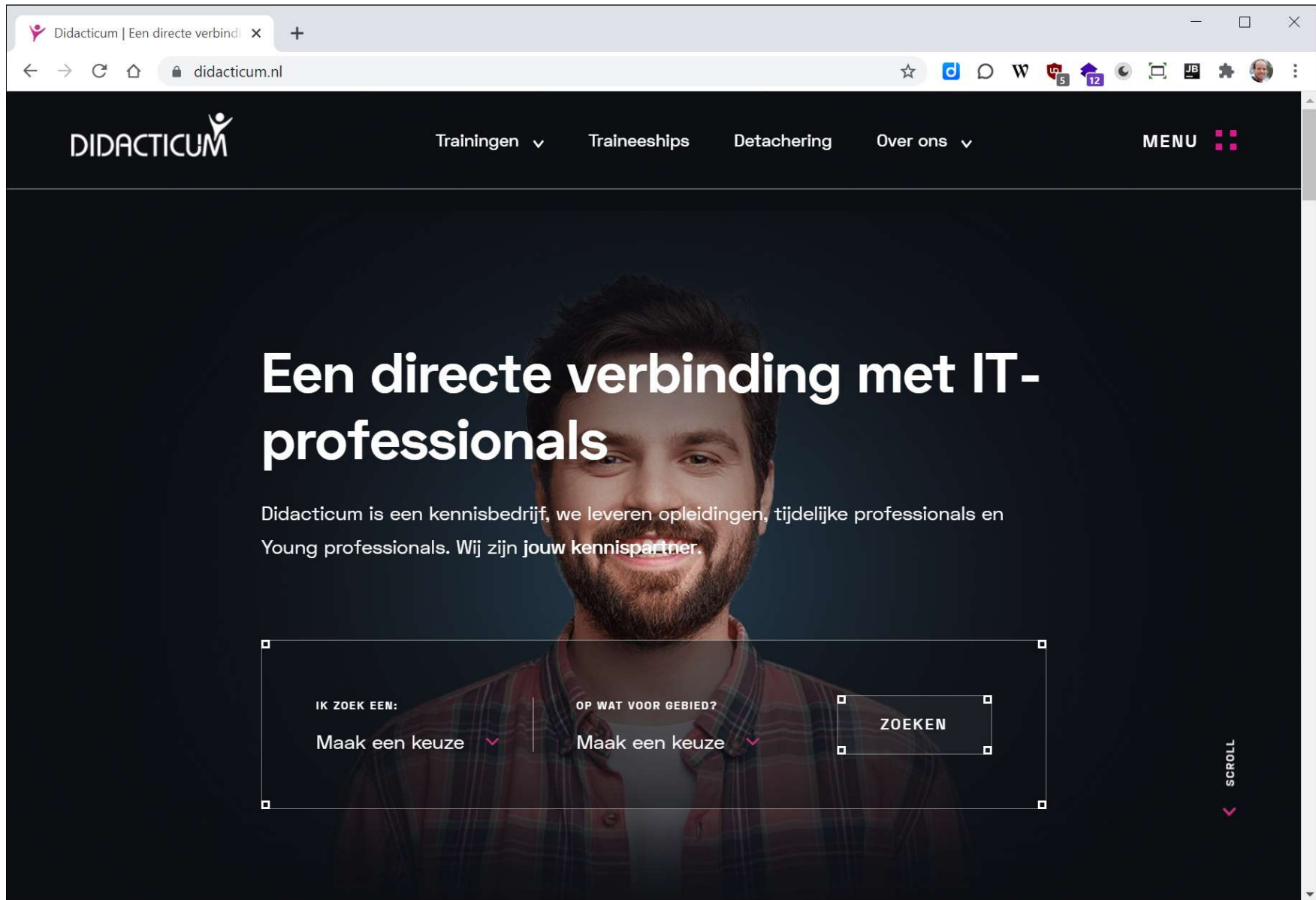


OBERON INTERACTIVE

woonbron

ROC West-Brabant

the eforum
FACTORY



<https://didacticum.nl>

Angulartraining.nl Home Training Dates Information Contact

2018 dates now available!



```
const routes: Routes = [
  { path: '', redirectTo: 'home', pathMatch: 'full' },
  { path: 'home', loadChildren: './home/home.module#HomeModule' },
  { path: 'training', loadChildren: './training/training.module#TrainingModule' },
];

const config: ExtraOptions = {
  enableTracing: false, // this on to for console logging of route events
  preloadingStrategy: PreloadingStrategyNoPreload,
};

@NgModule({
  imports: [RouterModule.forRoot(routes, config)],
  exports: [RouterModule]
})
export class AppRoutingModule {}
```

World-class Angular training in Dutch and English

Live classrooms - focused on today's developers

LEARN MORE SIGN UP!

www.angulartraining.nl

github.com/PeterKassenaar/snelstart

The screenshot shows the GitHub repository page for `PeterKassenaar/snelstart`. The repository is in the `main` branch, has 1 branch and 0 tags. It contains 2 commits, the latest being `92ba5d3` 1 minute ago. The repository has 1 watch, 0 stars, and 0 forks. The repository is described as "Slides en voorbeeldcode voor de training Angular, Snelstart - december 2020". The repository contains the following files:

File	Commit	Time
slides	Added first slides	1 minute ago
.gitignore	Added first slides	1 minute ago
LICENSE	Initial commit	2 days ago
README.md	Added first slides	1 minute ago

The `README.md` file content is as follows:

```
snelstart
```

Slides en voorbeeldcode voor de training Angular, Snelstart - december 2020

Links

- Repository met voorbeeldcode: <https://github.com/PeterKassenaar/voorbeeldenAngular2>

The right sidebar shows the repository's metadata:

- About:** Slides en voorbeeldcode voor de training Angular, Snelstart - december 2020. Includes links to Readme and MIT License.
- Releases:** No releases published. [Create a new release](#)
- Packages:** No packages published. [Publish your first package](#)

Over jullie



Voorkennis webdevelopment, (mobile/web-) apps?

(Kennis AngularJS 1.x?)

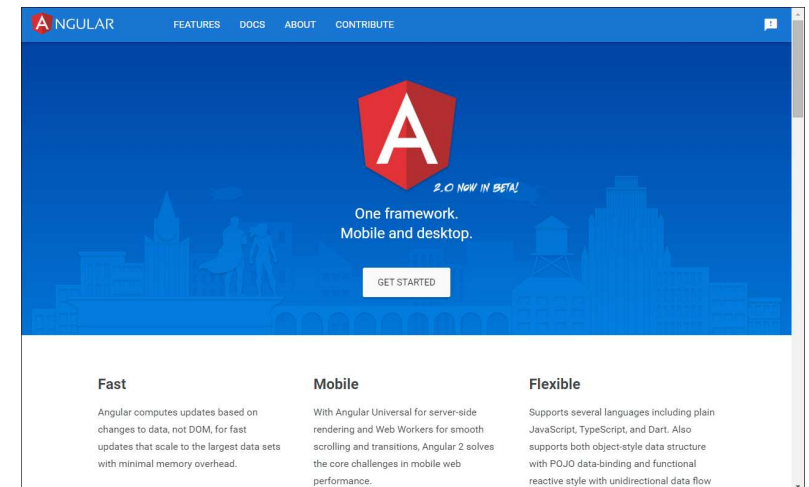
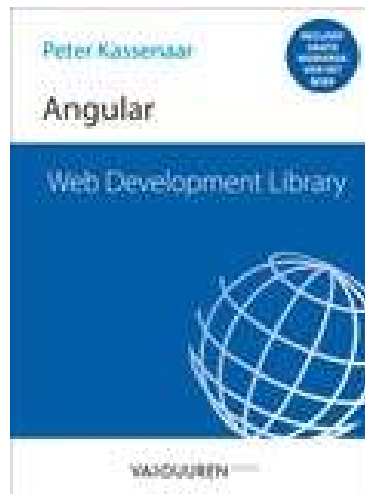
Voorkennis andere (web)talen?

Verwachtingen van de cursus?

Concrete projecten?

Materialen

Software	(Angular, NodeJS, editor, downloads)
Handouts	(Github - PDF)
Oefeningen	(Github)
Websites	(online)



angular.io/

Agenda - globally

30 November – 2 december – **ma - wo**

"Fundamentals"

December 2020 + januari 2021 - **ma-wo**

"Advanced"

~9:00 start

~ 10:30 Break

~12:00 lunch

~ 14:30 Break

~16:15-16:30 einde

Agenda - 3 dagen

- Introductie & geschiedenis - waarom Angular?
- Hello World in Angular – inzicht in boilerplate-code
- Angular in depth:
 - Components
 - ECMAScript 2015 + TypeScript
 - Data binding
 - Dependency Injection (DI) – more components
 - Services en http, Observables (RxJS)
 - Tree of Components
 - Routing, Forms
- BEST PRACTICES / STYLE GUIDE

Agenda

- Day 1 - Intro
 - Theory - Introductie & geschiedenis - why Angular
 - Hello World in Angular –boilerplate-code
 - Concepts, context & architecture
 - Angular CLI
 - Components
 - Data binding

Agenda

- Day 2 – Services & Communication
 - Services & DI
 - Observables (RxJS)
 - HTTP, Live API's,
 - Applications as a tree of components

Agenda

- Day 3 – **Next Steps** topics
 - Intercomponent communication
 - Creating event buses
 - Routing
 - (Forms
 - Template Driven Forms
 - Model Driven Forms)
- Later in dec. + Jan. – **Angular Advanced** topics

2 Richtlijnen

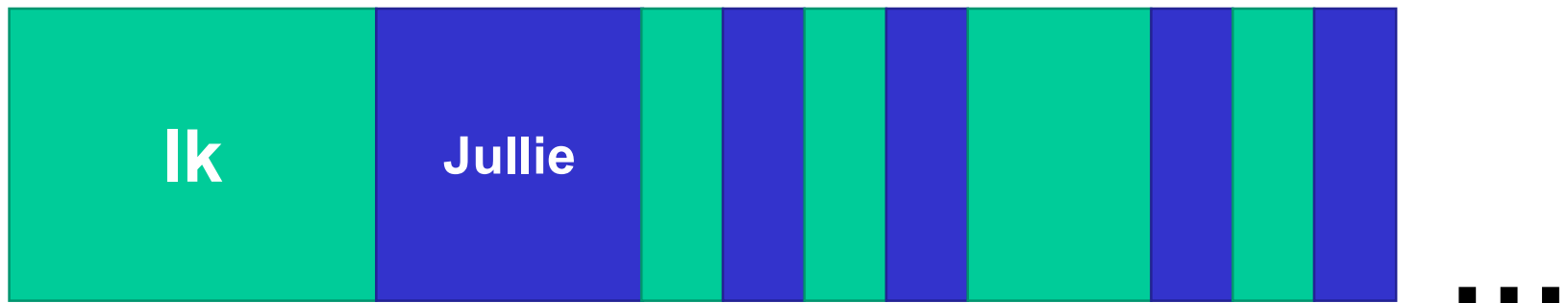
1. Oefeningen

- Maar: neem ook vooral zijpaden, experimenteer, lees verder, maak een eigen project, app, website...

2. Voorbeeldcode

- Als ondersteuning bij de oefeningen, zie boven
- Work in progress – check de Angular-site!
- github.com/PeterKassenaar/voorbeeldenAngular2

Globale werkwijze



Vragen?



Angular vs. The Rest

Differences, similarities, new features

Addressing the “WHY” question!

WHY, would we want to use a frontend framework.

It is all HTML, CSS and JavaScript right?

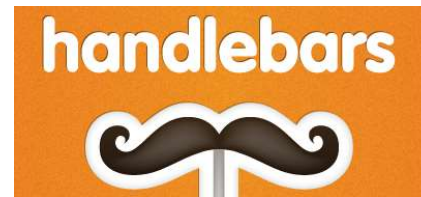
Rethorical question:

*“Do we want to go back
to the jQuery days?”*

speed,
consistency, not
re-inventing the
wheel, community,
performance,
testing....

Old school web apps

HTML + templates



Data Binding



Routing



DOM-manipulation



Mobile development

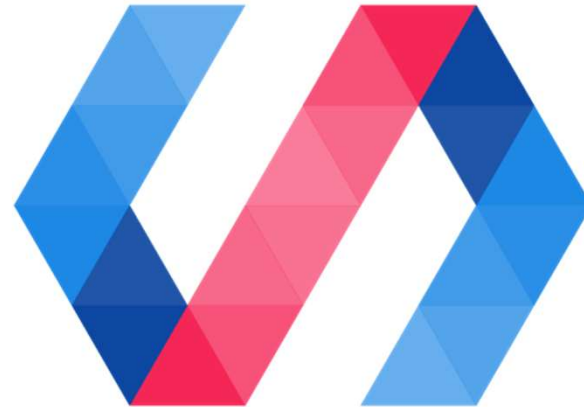
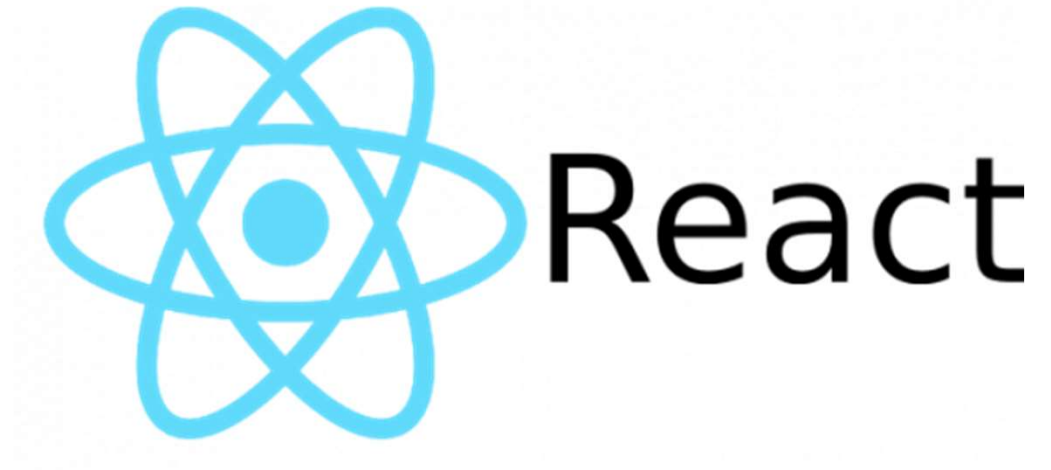


...

“The Frankenstein Framework”



Front-end Frameworks – the big four

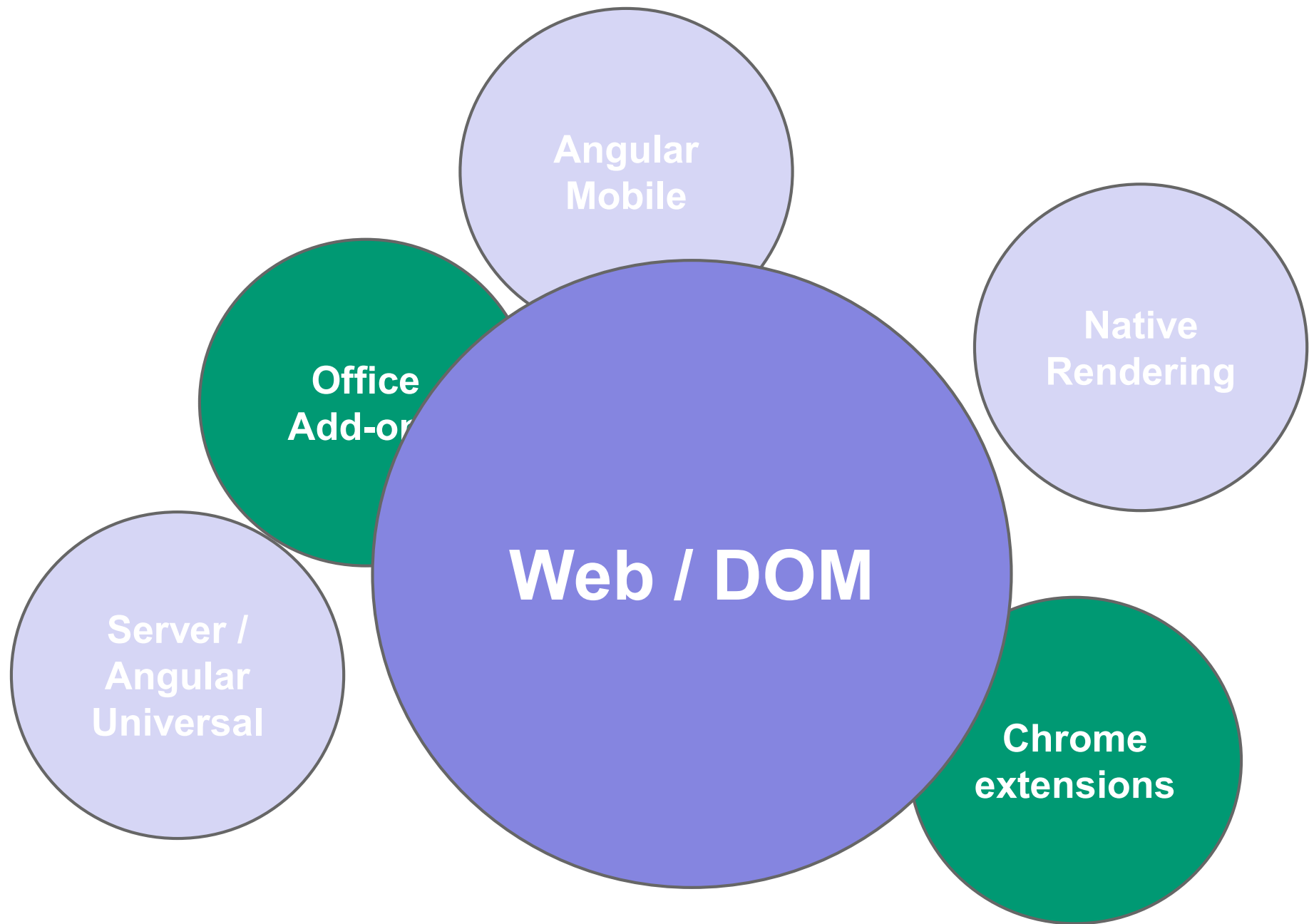




Platform

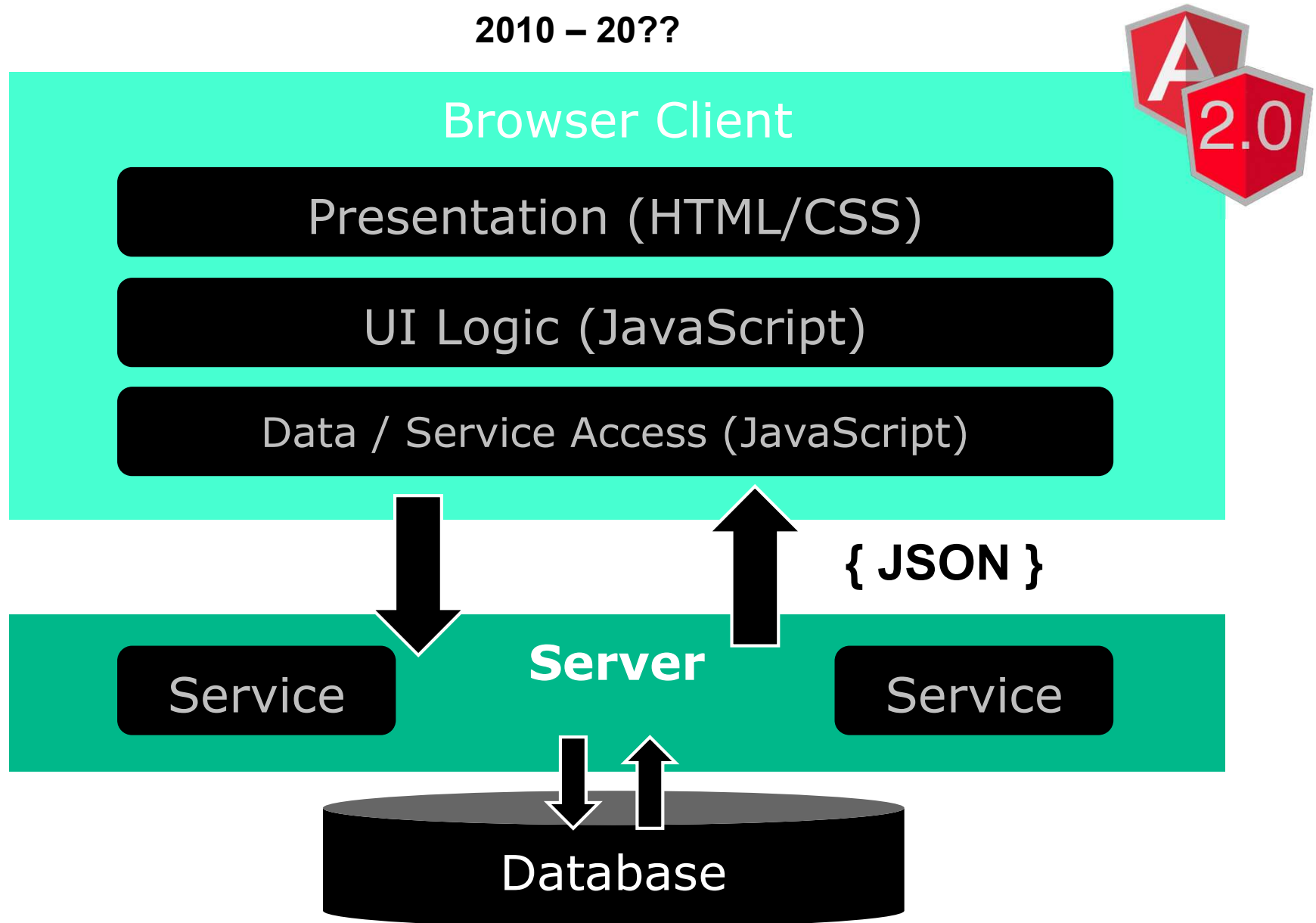
Platform Features

	Scaffolding	Code completion & Refactoring	Debugging
Tooling	Angular CLI	Language Services	Augury
Libraries	Material 2	Mobile	Universal
	AOT- Compile	Change Detection	Renderer
Core	Components & Dependency Injection	Decorators	Zones



Single Page Application

2010 – 20??





Time-based Releases

@IgorMinar, Nov. 9, 2018



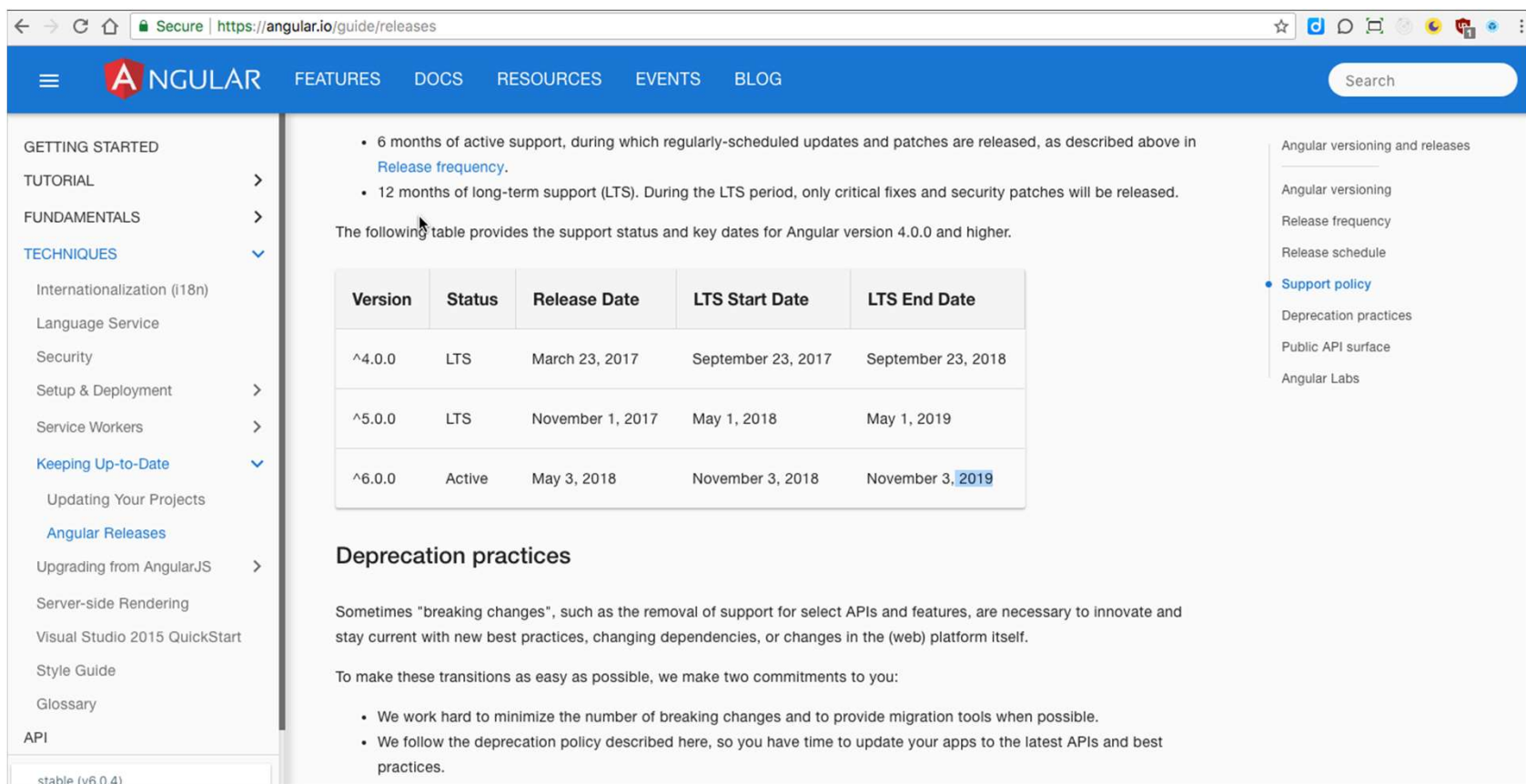
Predictable & Continuous
Evolution



- ✓ Predictability
- ✓ Painless Updates
- ✓ Long Term Support

Angular Versions en -Long Time Support

→ <https://angular.io/guide/releases>



The screenshot shows the Angular.io website's 'Releases' page. The page is titled 'Angular Versions en -Long Time Support' and includes a red link to <https://angular.io/guide/releases>. The page content is organized into a sidebar on the left, a main content area, and a right-hand navigation menu.

Left Sidebar:

- GETTING STARTED
- TUTORIAL >
- FUNDAMENTALS >
- TECHNIQUES ✓
- Internationalization (i18n)
- Language Service
- Security
- Setup & Deployment >
- Service Workers >
- Keeping Up-to-Date ✓
- Updating Your Projects
- Angular Releases
- Upgrading from AngularJS >
- Server-side Rendering
- Visual Studio 2015 QuickStart
- Style Guide
- Glossary
- API
- stable (v6.0.4)

Main Content Area:

- 6 months of active support, during which regularly-scheduled updates and patches are released, as described above in [Release frequency](#).
- 12 months of long-term support (LTS). During the LTS period, only critical fixes and security patches will be released.

The following table provides the support status and key dates for Angular version 4.0.0 and higher.

Version	Status	Release Date	LTS Start Date	LTS End Date
^4.0.0	LTS	March 23, 2017	September 23, 2017	September 23, 2018
^5.0.0	LTS	November 1, 2017	May 1, 2018	May 1, 2019
^6.0.0	Active	May 3, 2018	November 3, 2018	November 3, 2019

Deprecation practices

Sometimes "breaking changes", such as the removal of support for select APIs and features, are necessary to innovate and stay current with new best practices, changing dependencies, or changes in the (web) platform itself.

To make these transitions as easy as possible, we make two commitments to you:

- We work hard to minimize the number of breaking changes and to provide migration tools when possible.
- We follow the deprecation policy described here, so you have time to update your apps to the latest APIs and best practices.

Right-hand Navigation Menu:

- Angular versioning and releases
- Angular versioning
- Release frequency
- Release schedule
- Support policy
- Deprecation practices
- Public API surface
- Angular Labs

<https://update.angular.io/>

Angular Update Guide

Select the options matching your project:

Angular Version

4.0 6.0

App Complexity

Basic Medium Advanced

ngUpgrade

☐ I use ngUpgrade

Package Manager

npm yarn

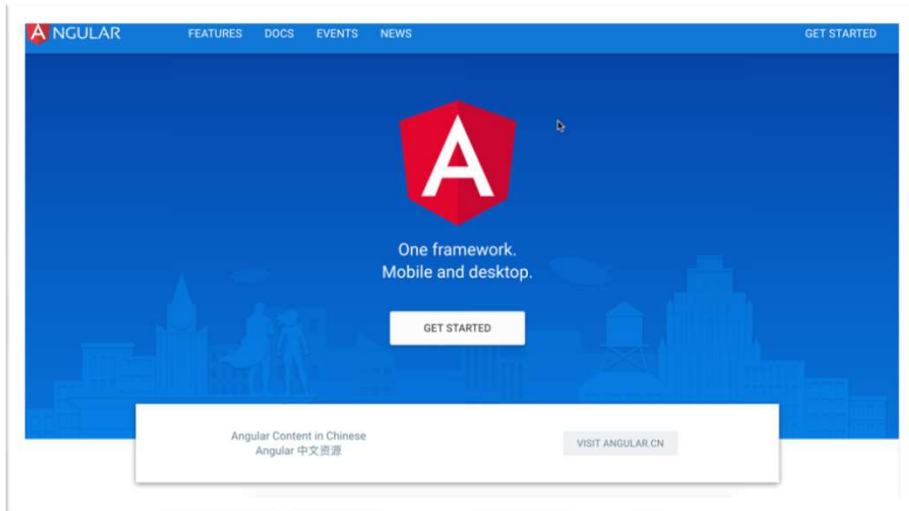
Show me how to update!

Warning: We do not recommend moving across multiple major versions.

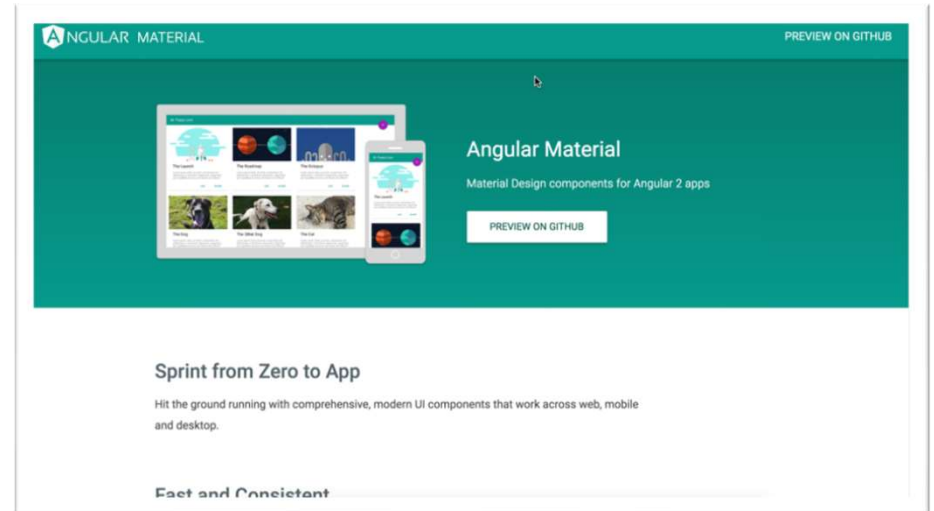
"It's just

Angular

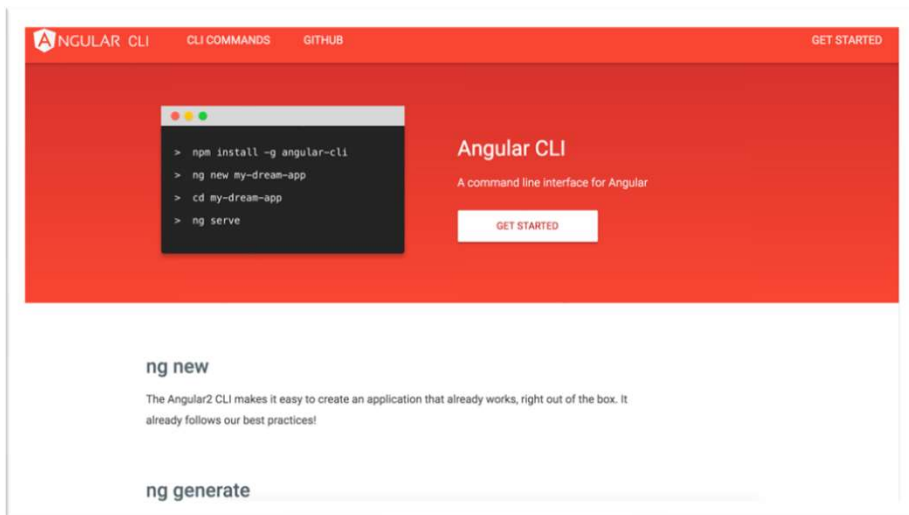
Angular as a Platform



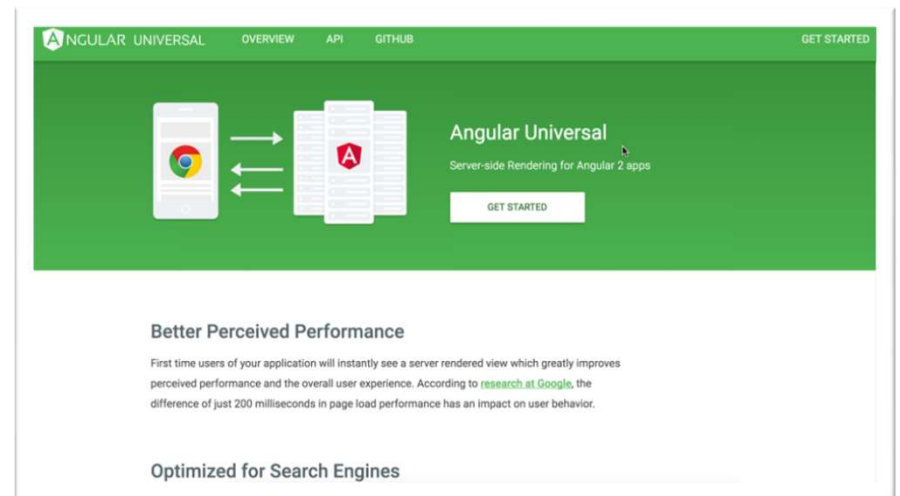
<https://angular.io/>



<https://material.angular.io/>

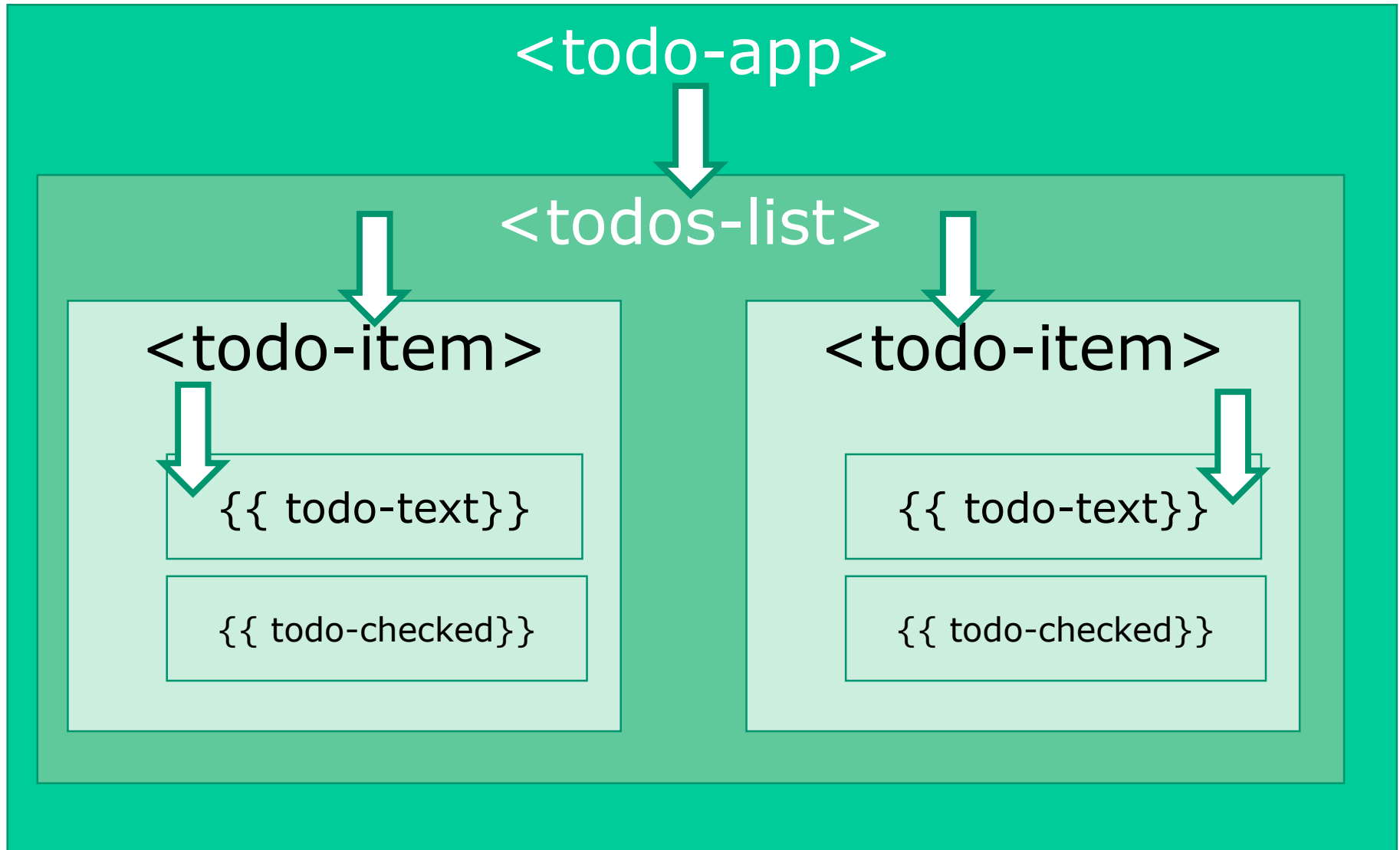


<https://cli.angular.io/>



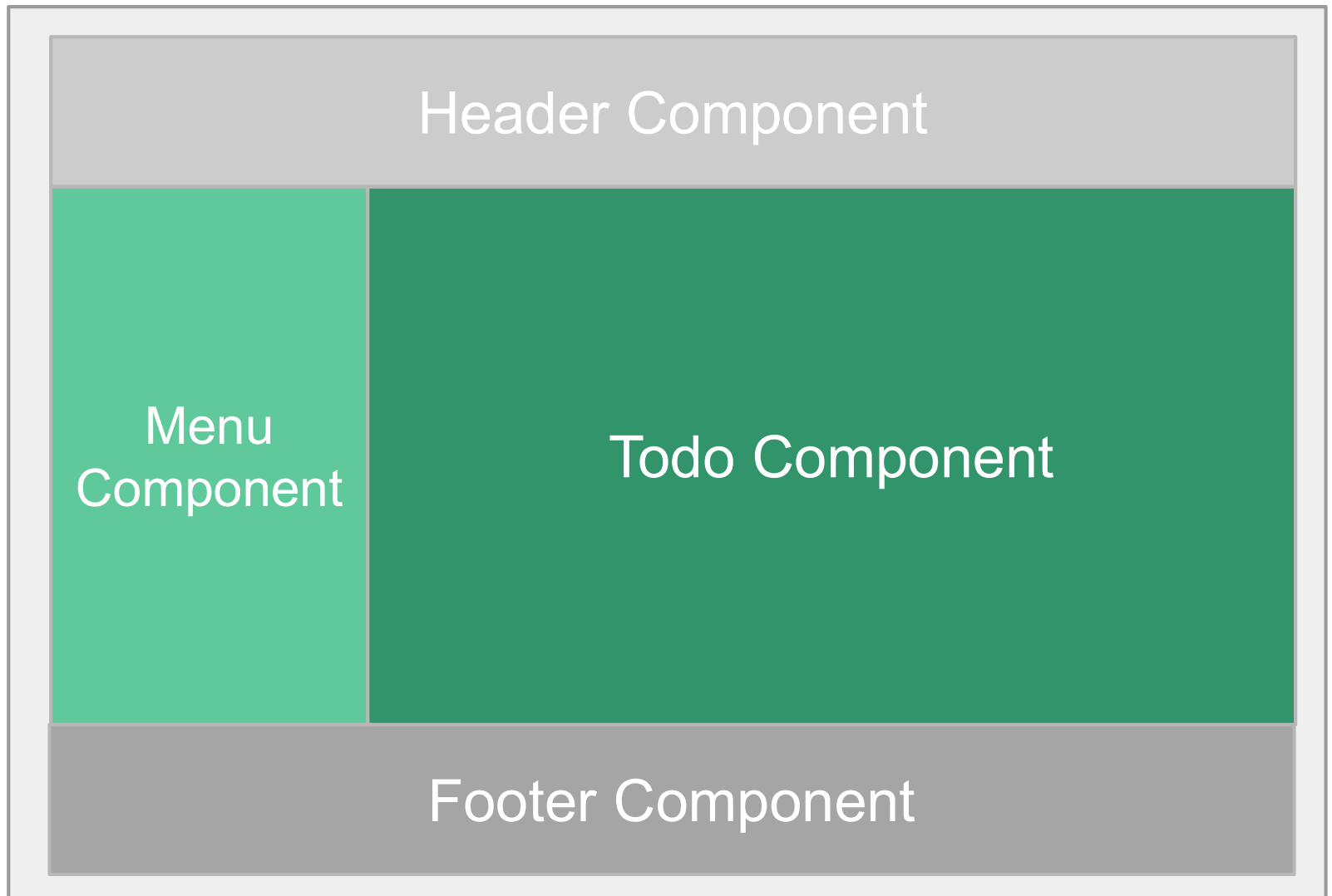
<https://universal.angular.io/>

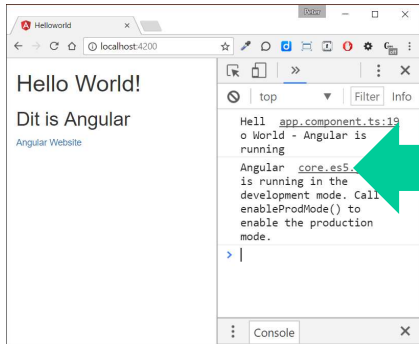
Angular 2 - components



*"An Angular-app is a tree
of components"*

Components – visual representation





main.ts / bootstrapper

ngModule / root module

AppComponent

Services

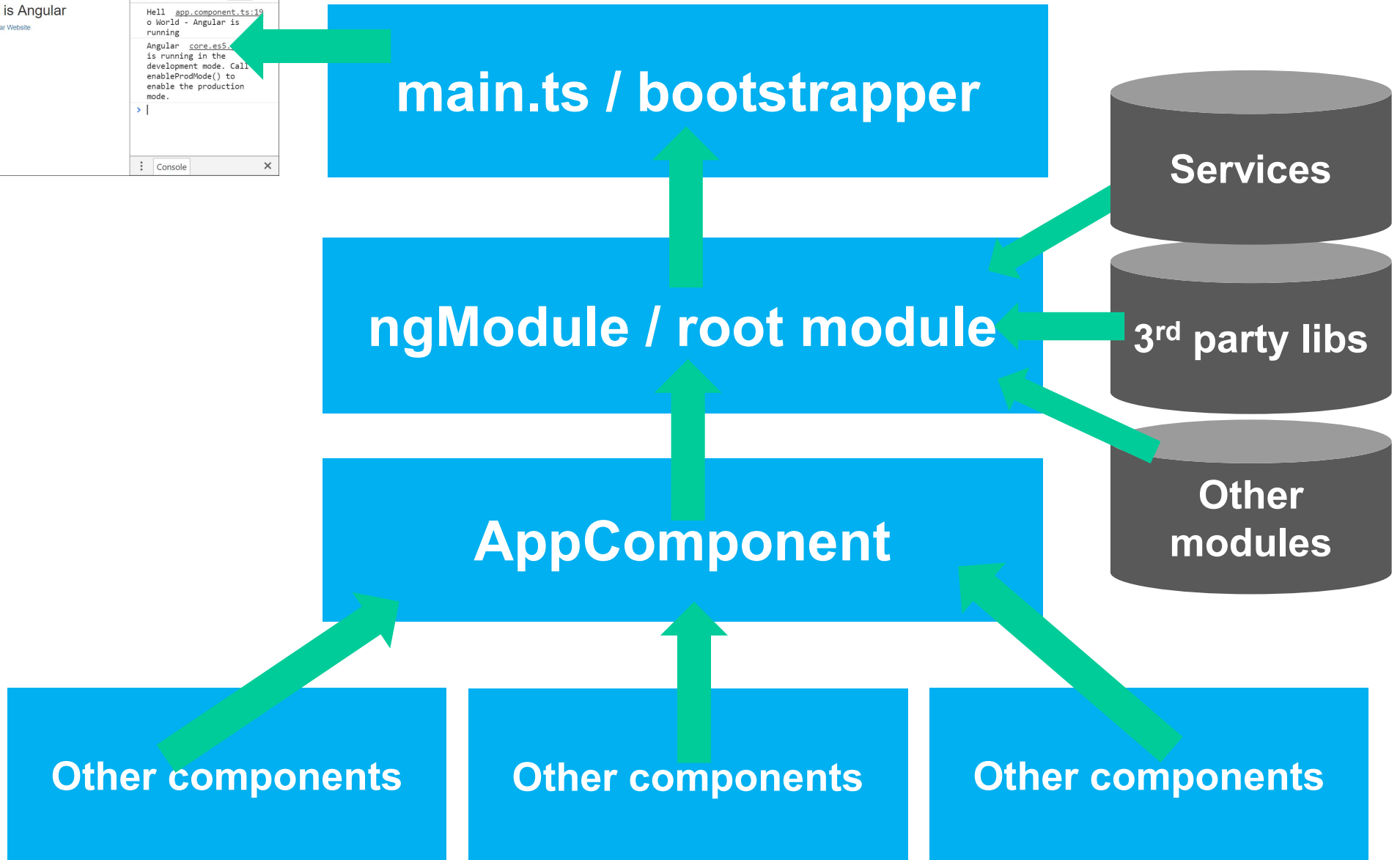
3rd party libs

Other modules

Other components

Other components

Other components





Let's write some code

Hello World in Angular

Angular 1:

```
<script src="angular.min.js"></script>
```

Angular development dependency: NodeJS 10+



The screenshot shows the Node.js website with a dark header containing the Node.js logo and navigation links: HOME, ABOUT, DOWNLOADS, DOCS, GET INVOLVED, SECURITY, NEWS, and FOUNDATION (highlighted in green). Below the header, the text states: "Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#)." The main section is titled "Download for macOS (x64)" and features two green buttons: "12.13.0 LTS" with the subtext "Recommended For Most Users" and "13.0.1 Current" with the subtext "Latest Features". Below these buttons are links for "Other Downloads", "Changelog", and "API Docs" for both versions. Further down, it says "Or have a look at the [Long Term Support \(LTS\) schedule](#)." and "Sign up for [Node.js Everywhere](#), the official Node.js Monthly Newsletter." The footer includes the Linux Foundation logo and text: "COLLABORATIVE PROJECTS", "© Node.js Foundation. All Rights Reserved. Portions of this site originally © Joyent.", "Node.js is a trademark of Joyent, Inc. and is used with its permission. Please review the Trademark Guidelines of the Node.js Foundation.", "Linux Foundation is a registered trademark of The Linux Foundation.", and "Linux is a registered trademark of Linus Torvalds." There are also links for "Report Node.js issue", "Report website issue", and "Get Help".

node

HOME | ABOUT | DOWNLOADS | DOCS | GET INVOLVED | SECURITY | NEWS | FOUNDATION

Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#).

Download for macOS (x64)

12.13.0 LTS
Recommended For Most Users

13.0.1 Current
Latest Features

[Other Downloads](#) | [Changelog](#) | [API Docs](#) [Other Downloads](#) | [Changelog](#) | [API Docs](#)

Or have a look at the [Long Term Support \(LTS\) schedule](#).

Sign up for [Node.js Everywhere](#), the official Node.js Monthly Newsletter.

 **LINUX FOUNDATION** COLLABORATIVE PROJECTS

Report Node.js issue | Report website issue | Get Help

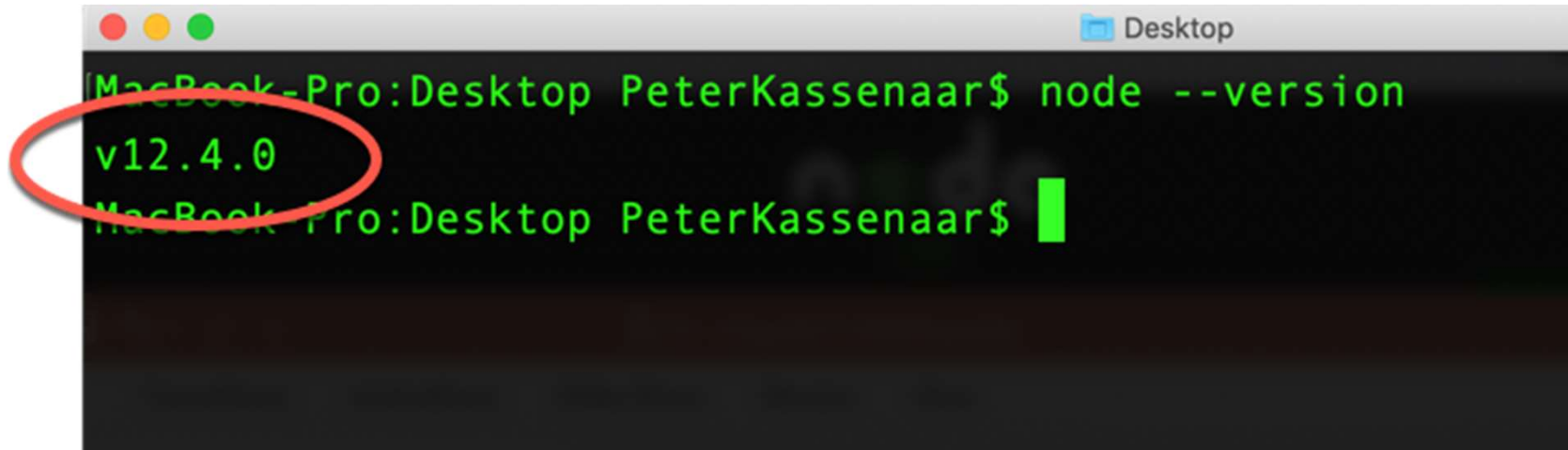
© Node.js Foundation. All Rights Reserved. Portions of this site originally © Joyent.

Node.js is a trademark of Joyent, Inc. and is used with its permission. Please review the Trademark Guidelines of the Node.js Foundation.

Linux Foundation is a registered trademark of The Linux Foundation.

Linux is a registered trademark of Linus Torvalds.

Node – check your version

A screenshot of a macOS terminal window. The window has a title bar with three colored buttons (red, yellow, green) on the left and a label 'Desktop' on the right. The terminal text is green on a black background. The first line shows the command 'node --version' being executed. The second line shows the output 'v12.4.0', which is circled in red. The third line shows the prompt 'MacBook-Pro:Desktop PeterKassenaar\$' followed by a green cursor bar.

```
MacBook-Pro:Desktop PeterKassenaar$ node --version  
v12.4.0  
MacBook-Pro:Desktop PeterKassenaar$
```


Mini workshop

- Download or clone
<https://github.com/PeterKassenaar/voorbeeldenAngular2>

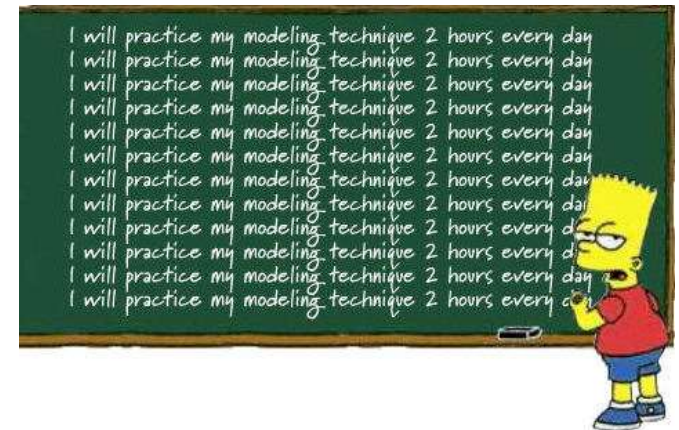
```
cd examples
```

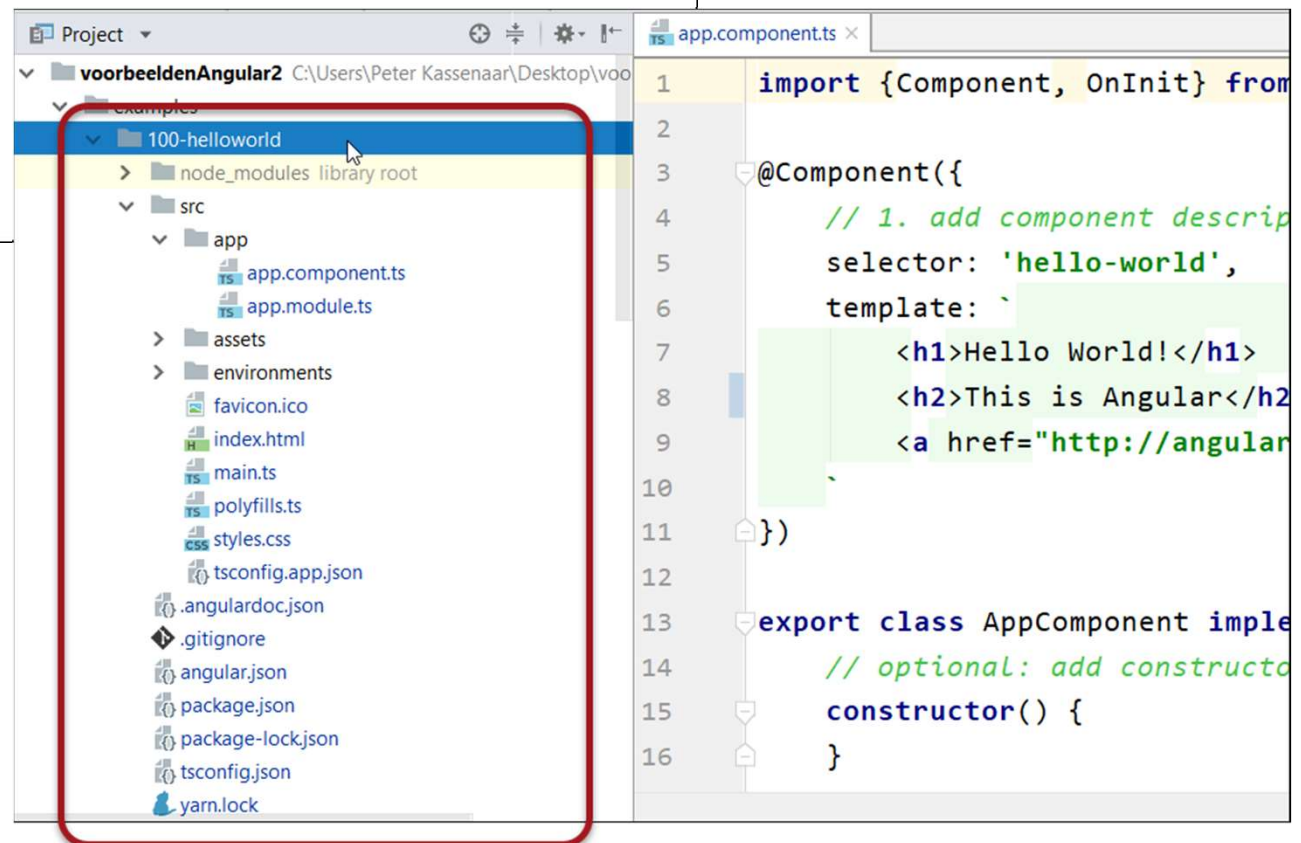
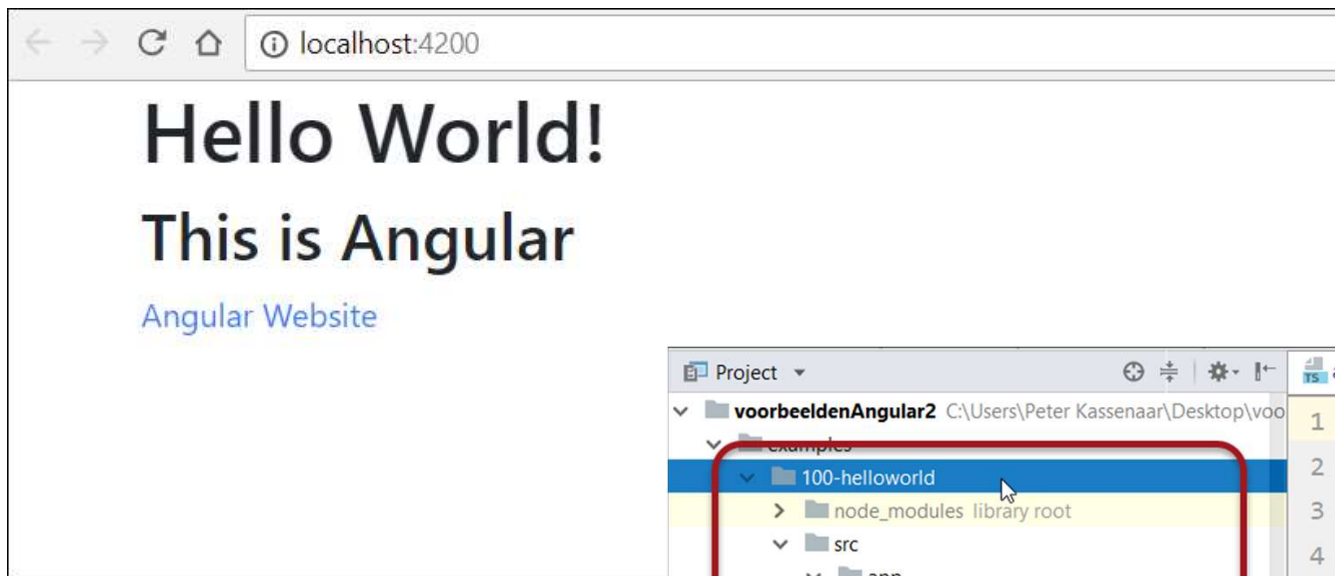
```
cd 100-helloworld
```

```
npm install
```

```
npm start
```

- Go to browser: <http://localhost:4200>





Boilerplate code for Hello World

Steps

1. Set up environment, boilerplate & libraries
 - Important configuration files
2. Angular Component(s)
3. Angular Module(s): @ngModule()
4. Bootstrap our module
5. Write HTML-pagina (`index.html`)



Boilerplate files #1 - package.json

```
{
  "name": "hello-angular",
  "description": "Voorbeeldproject bij de training Angular (C) - info@kassenaar.com",
  "version": "0.0.1",
  "license": "MIT",
  "scripts": {
    "ng": "ng",
    "start": "ng serve",
    "build": "ng build",
  },
  "private": true,
  "dependencies": {
    "@angular/animations": "6.0.0",
    "@angular/common": "6.0.0",
    "@angular/compiler": "6.0.0",
    "@angular/core": "6.0.0",
    "@angular/forms": "6.0.0",
    "rxjs": "^6.1.0",
    "zone.js": "^0.8.26"
  },
  "devDependencies": {
    "@angular-devkit/build-angular": "~0.6.0",
    "@angular/cli": "6.0.0",
    "typescript": "2.7.2"
  },
  "author": "Peter Kassenaar <info@kassenaar.com>"
}
```

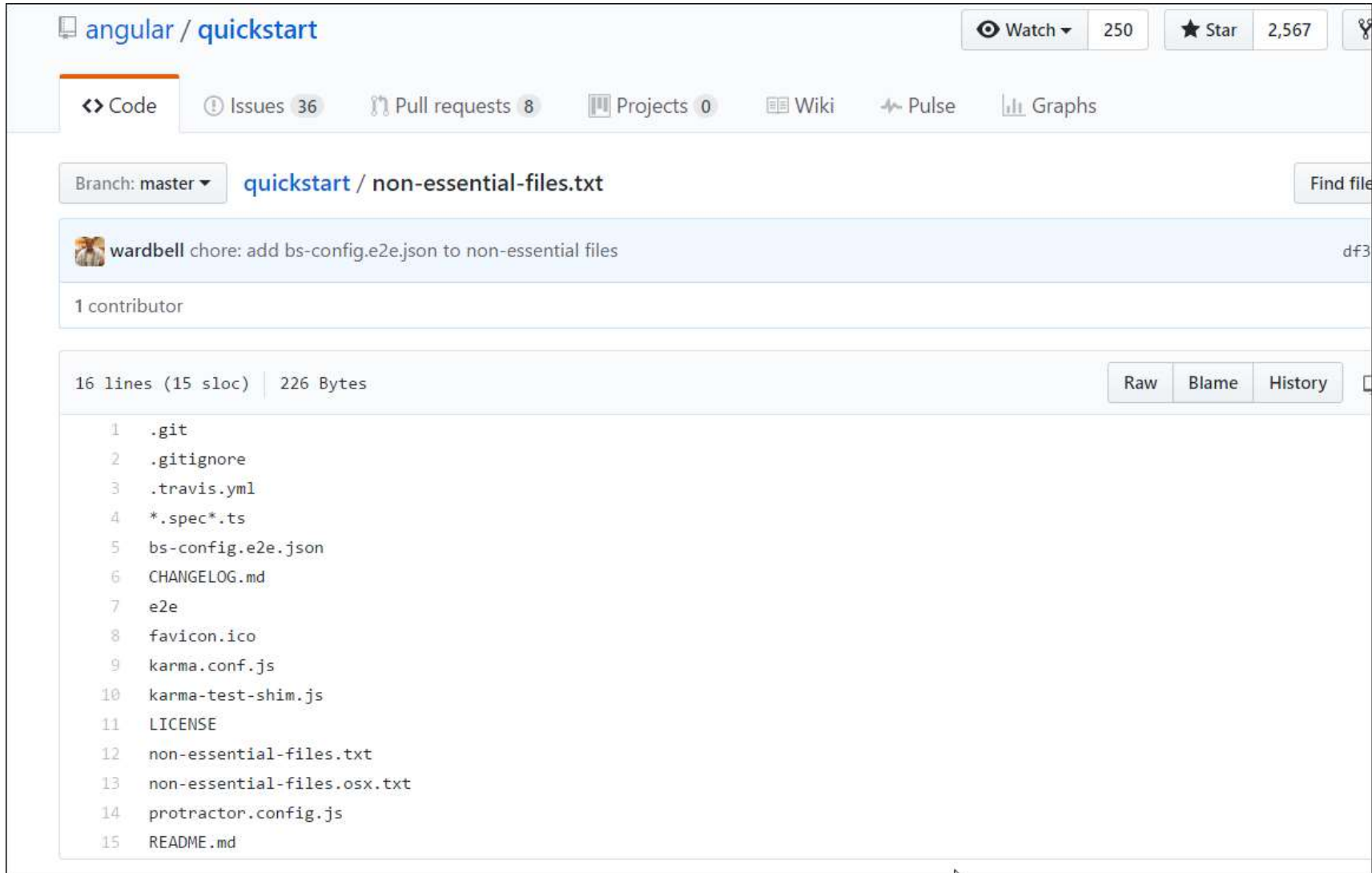
Boilerplate files #2 - tsconfig.json

```
{
  "compileOnSave" : false,
  "compilerOptions": {
    "outDir"           : "./dist/out-tsc",
    "baseUrl"          : "src",
    "sourceMap"         : true,
    "declaration"       : false,
    "moduleResolution"  : "node",
    "emitDecoratorMetadata" : true,
    "experimentalDecorators": true,
    "target"            : "es5",
    "typeRoots"         : [
      "node_modules/@types"
    ],
    "lib"               : [
      "es2016",
      "dom"
    ]
  }
}
```

Boilerplate files #3 – angular.json

```
{
  "$schema": "./node_modules/@angular/cli/lib/config/schema.json",
  "version": 1,
  "newProjectRoot": "projects",
  "projects": {
    "helloworld": {
      "root": "",
      "sourceRoot": "src",
      "projectType": "application",
      "architect": {
        "build": {
          "builder": "@angular-devkit/build-angular:browser",
          "options": {
            "outputPath": "dist",
            "index": "src/index.html",
            "main": "src/main.ts",
            "tsConfig": "src/tsconfig.app.json",
            ...
          }
        }
      }
    }
  }
}
```

"Nice to have" - non-essential files



The screenshot shows the GitHub interface for the 'angular/quickstart' repository. The file 'non-essential-files.txt' is selected, showing its commit history and content. The commit was made by 'wardbell' with the message 'chore: add bs-config.e2e.json to non-essential files'. The file content lists 15 non-essential files in the repository.

angular / quickstart

Watch 250 Star 2,567

Code Issues 36 Pull requests 8 Projects 0 Wiki Pulse Graphs

Branch: master quickstart / non-essential-files.txt Find file

wardbell chore: add bs-config.e2e.json to non-essential files df3

1 contributor

16 lines (15 sloc) 226 Bytes Raw Blame History

```
1 .git
2 .gitignore
3 .travis.yml
4 *.spec*.ts
5 bs-config.e2e.json
6 CHANGELOG.md
7 e2e
8 favicon.ico
9 karma.conf.js
10 karma-test-shim.js
11 LICENSE
12 non-essential-files.txt
13 non-essential-files.osx.txt
14 protractor.config.js
15 README.md
```

<https://github.com/angular/quickstart/blob/master/non-essential-files.txt>

Step 2 – Component

Convention - components in directory `/src/app`

Or: edit in `angular.json`

Filename: `src/app/app.component.ts`

```
import {Component} from '@angular/core';  
@Component({  
  selector: 'hello-world',  
  template: '<h1>Hello Angular</h1>'  
})  
export class AppComponent {  
  
}
```


Step 3 – @NgModule

Convention - filename: `/src/app.module.ts`

```
// Angular Modules
import {NgModule}      from '@angular/core';
import {BrowserModule} from '@angular/platform-browser';

// Custom Components
import {AppComponent} from './app.component';

// Module declaration
@NgModule({
  imports      : [BrowserModule],
  declarations: [AppComponent],
  bootstrap    : [AppComponent]
})
export class AppModule {
}
```

Root Module of the application

Some background info on Root Module



<https://johnpapa.net/introducing-angular-modules-root-module/>

Step 4 - bootstrap component

Best practice: bootstrap app in separate component

Convention: `main.ts`, of `app.main.ts`.

```
import {enableProdMode} from '@angular/core';
import {platformBrowserDynamic} from '@angular/platform-browser-dynamic';

import {AppModule} from '../app/app.module';
import {environment} from '../environments/environment';

if (environment.production) {
  enableProdMode();
}

platformBrowserDynamic().bootstrapModule(AppModule);
```

Step 5 – index.html

index.html - simple HTML file - expanded at runtime by WebPack

Header:

```
<html>
```

```
<head>
```

```
  <meta charset="utf-8">
```

```
  <title>Helloworld</title>
```

```
  <base href="/">
```

```
  <meta name="viewport" content="width=device-width, initial-scale=1">
```

```
  <link rel="icon" type="image/x-icon" href="favicon.ico">
```

```
</head>
```

Body van index.html

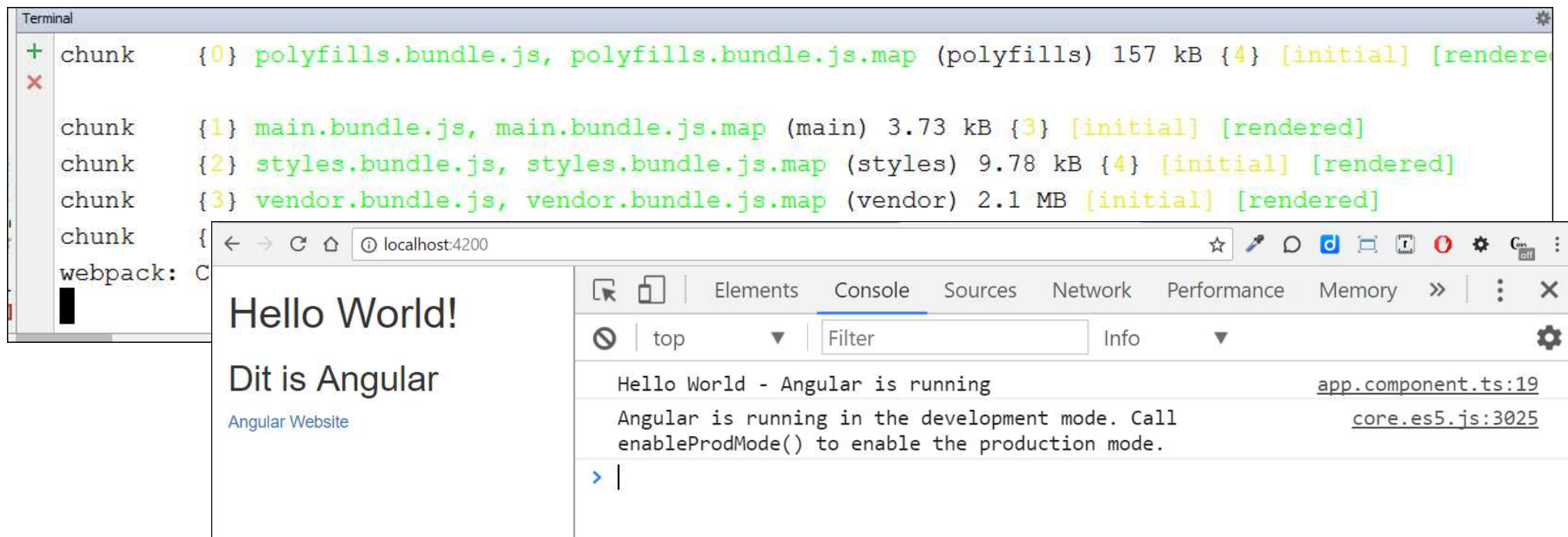
Verwijzing naar de root-component:

```
<body>  
  <hello-world>  
    Bezig met laden...  
  </hello-world>  
</body>
```

App draaien

`npm start` – draait de scriptopdracht start uit `package.json`.

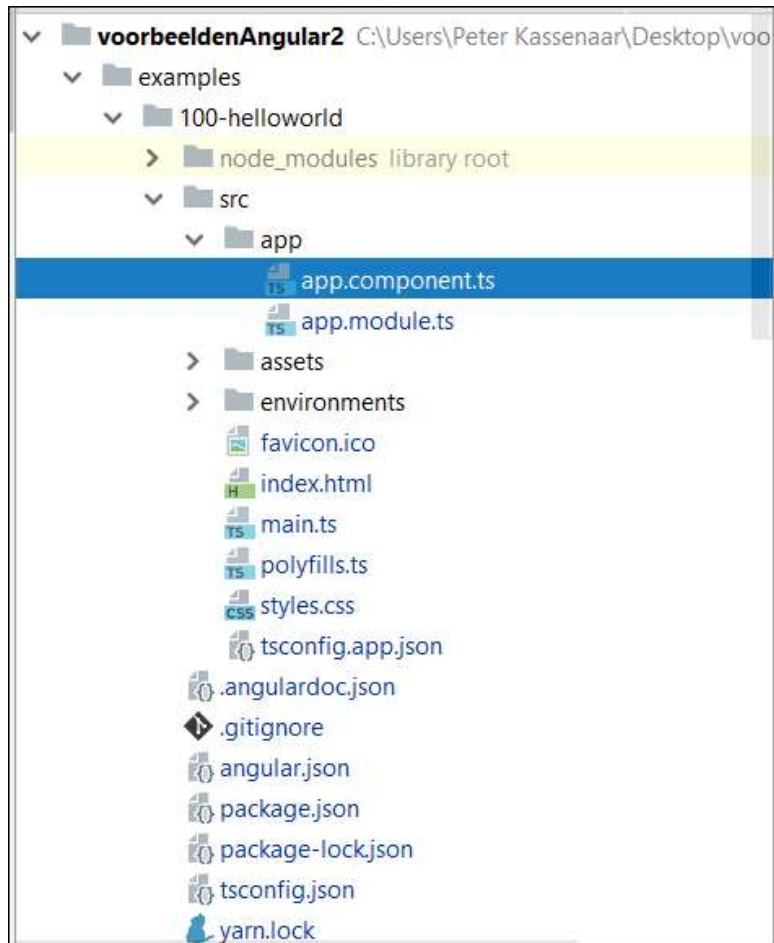
`ng serve` – start globale angular-cli instantie

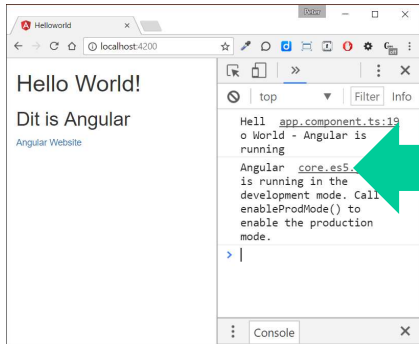


Daarna: wijzigingen aanbrengen in `app.component.ts`

– worden opgepikt door Live Reload

Basic Project Structure





main.ts / bootstrapper

ngModule / root module

AppComponent

Services

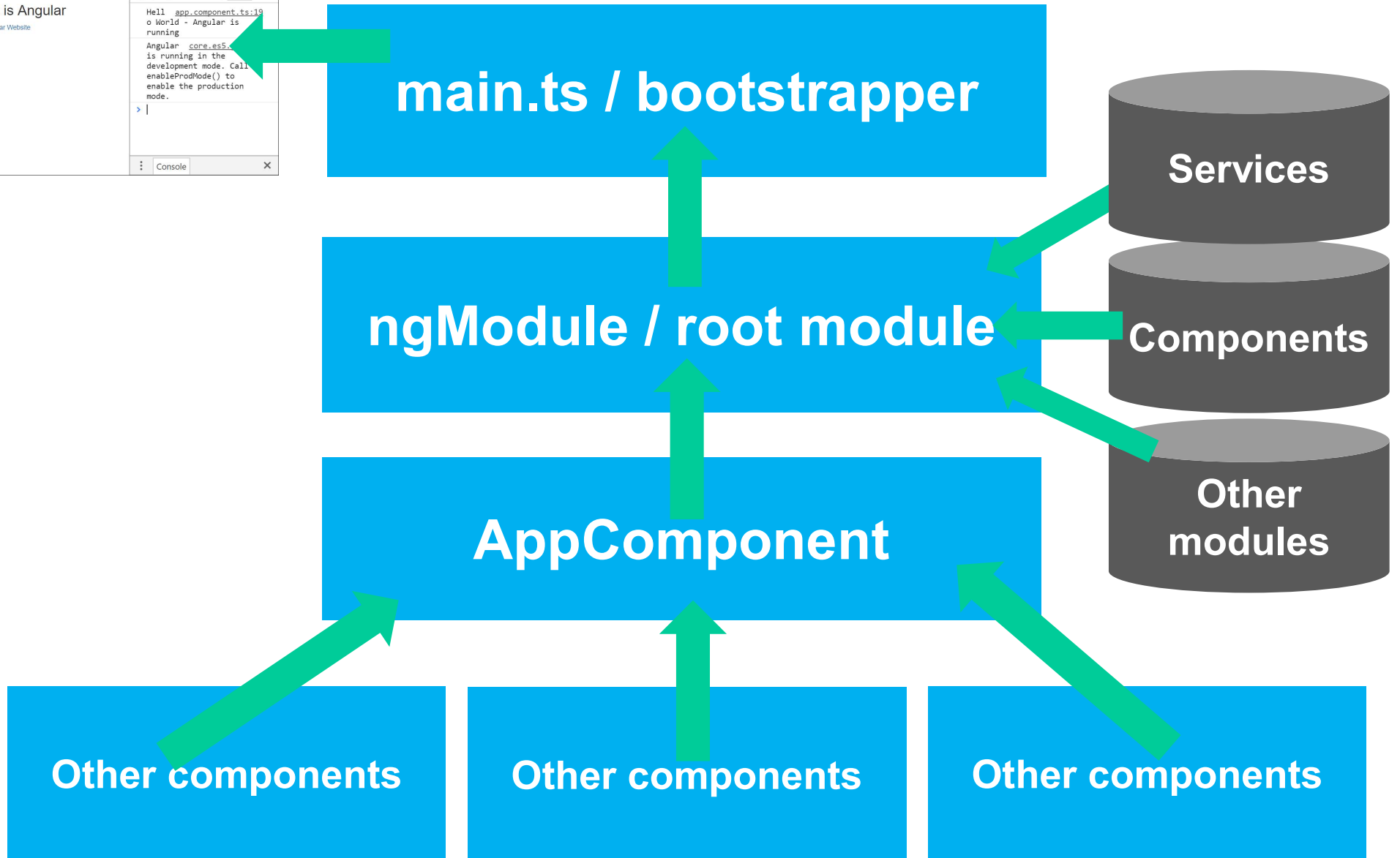
Components

**Other
modules**

Other components

Other components

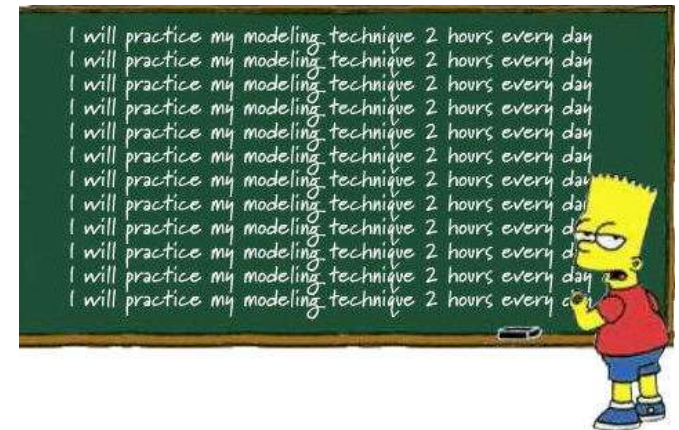
Other components



Checkpoint

- Er is aardig wat boilerplate code nodig om een Angular-app te starten
- Vier stappen
 1. Set up environment, boilerplate & libraries
 2. Schrijf Angular Root Component voor de app
 3. Bootstrap de component
 4. Schrijf HTML-pagina (`index.html`)
- Daarna: app gaan uitbreiden
- Oefening 1a), 1b), 1c), 1d)

Oefening....



Assets

github.com/PeterKassenaar/voorbeeldenAngular2

Oefeningen en meer voorbeeldcode



Angular CLI

Snel nieuwe projecten instellen via de command line

Angular-CLI to the rescue

- Het *is* mogelijk nieuwe Angular-projecten from scratch te starten.
- Met de CLI is eenvoudiger.
- CLI-options:
 - Scaffolding
 - Generating
 - Testing
 - Building
 - AOT-Compiling
 - ...

Scaffolding - Angular CLI

Projecten, componenten, routes en meer definiëren
vanaf de command line

<https://github.com/angular/angular-cli>

en

<https://cli.angular.io/>

typings.json chore(): add typings files to assist devs 4 months ago

README.md

Angular-CLI

chat on gitter

build passing dependencies up to date devDependencies up to date npm v1.0.0-beta.5

Prototype of a CLI for Angular 2 applications based on the [ember-cli](#) project.

Note

This project is very much still a work in progress.

We still have a long way before getting out of our alpha stage. If you wish to collaborate while the project is still young, check out [our issue list](#).

Prerequisites

The generated project has dependencies that require **Node 4 or greater**.

Table of Contents

- [Installation](#)
- [Usage](#)
- [Generating a New Project](#)
- [Generating Components, Directives, Pipes and Services](#)
- [Generating a Route](#)
- [Creating a Build](#)
- [Running Unit Tests](#)
- [Running End-to-End Tests](#)
- [Deploying the App via GitHub Pages](#)
- [Linting and formatting code](#)
- [Support for offline applications](#)
- [Commands autocompletion](#)
- [CSS preprocessor integration](#)
- [3rd Party Library Installation](#)

```
npm install -g @angular/cli
```

```
> npm install -g angular-cli  
> ng new my-dream-app  
> cd my-dream-app  
> ng serve
```

Angular CLI

A command line interface for Angular

GET STARTED

ng new

The Angular2 CLI makes it easy to create an application that already works, right out of the box. It already follows our best practices!

ng generate

Generate components, routes, services and pipes with a simple command. The CLI will also create simple test shells for all of these.



The video player displays a presentation slide with a dark background. The slide has a title "CLI can..." in white text. Below the title is a white rectangular box with a red, yellow, and green window control bar. Inside this box, the command `> ng generate component my-comp` is shown in white text. To the right of the slide, a small inset video shows a man in a green t-shirt standing on a stage with a circuit board background. Below the slide, the "NG CONF" logo is visible. The video player interface at the bottom includes a progress bar, playback controls (play, pause, next, volume), and a timestamp of 4:50 / 23:39. The video title "Learn Clingon - Mike Brocchi" is displayed at the bottom of the player.

CLI can...

```
> ng generate component my-comp
```

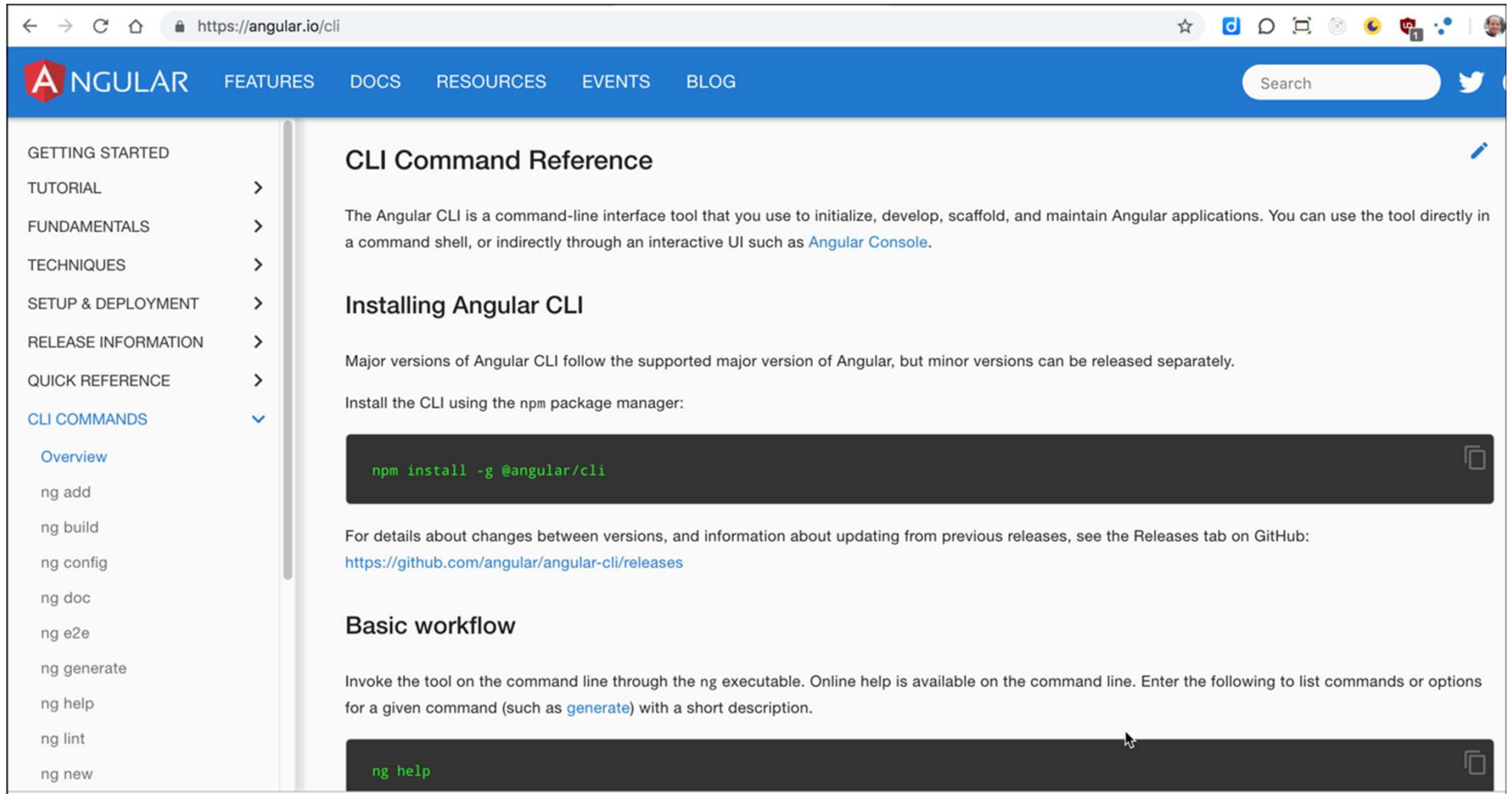
NG
CONF

4:50 / 23:39

Learn Clingon - Mike Brocchi

<https://www.youtube.com/watch?v=wHZe6gGI5RY>

Documentatie - in de Angular Docs



The screenshot shows the Angular CLI documentation page. The browser address bar displays `https://angular.io/cli`. The top navigation bar includes the Angular logo, links for FEATURES, DOCS, RESOURCES, EVENTS, and BLOG, a search bar, and social media icons. The left sidebar lists the documentation structure: GETTING STARTED, TUTORIAL, FUNDAMENTALS, TECHNIQUES, SETUP & DEPLOYMENT, RELEASE INFORMATION, QUICK REFERENCE, and CLI COMMANDS (which is expanded to show Overview, ng add, ng build, ng config, ng doc, ng e2e, ng generate, ng help, ng lint, and ng new). The main content area is titled "CLI Command Reference" and includes an introduction to the Angular CLI, a section for "Installing Angular CLI" with a code block for `npm install -g @angular/cli`, a link to the GitHub releases page, a "Basic workflow" section, and a code block for `ng help`.

← → ↻ 🏠 `https://angular.io/cli` ☆ [Icons] | [Profile]

ANGULAR FEATURES DOCS RESOURCES EVENTS BLOG Search [Twitter]

GETTING STARTED
TUTORIAL >
FUNDAMENTALS >
TECHNIQUES >
SETUP & DEPLOYMENT >
RELEASE INFORMATION >
QUICK REFERENCE >
CLI COMMANDS ✓
 Overview
 ng add
 ng build
 ng config
 ng doc
 ng e2e
 ng generate
 ng help
 ng lint
 ng new

CLI Command Reference

The Angular CLI is a command-line interface tool that you use to initialize, develop, scaffold, and maintain Angular applications. You can use the tool directly in a command shell, or indirectly through an interactive UI such as [Angular Console](#).

Installing Angular CLI

Major versions of Angular CLI follow the supported major version of Angular, but minor versions can be released separately.

Install the CLI using the npm package manager:

```
npm install -g @angular/cli
```

For details about changes between versions, and information about updating from previous releases, see the Releases tab on GitHub:
<https://github.com/angular/angular-cli/releases>

Basic workflow

Invoke the tool on the command line through the ng executable. Online help is available on the command line. Enter the following to list commands or options for a given command (such as [generate](#)) with a short description.

```
ng help
```

<https://angular.io/cli>



Angular 2 Code - Backend

Kort over TypeScript en ES6

Programmeertalen





A Venn diagram consisting of three concentric circles. The outermost circle is dark teal and contains the text 'TypeScript'. Inside it is a medium teal circle containing the text 'ES6'. Inside the 'ES6' circle is a light teal circle containing the text 'ES5'. This visualizes that TypeScript includes all features of ES6 and ES5, and ES6 includes all features of ES5.

TypeScript

ES6

ES5

ES6 en TypeScript

De toekomst van JavaScript is ES6/ES2015

Major update van JavaScript als programmeertaal

Modules, classes en meer

Helpt bij het ontwikkelen in Angular 2

TypeScript breidt ES6 verder uit

Annotaties & types

Interfaces

Compiler

TypeScript – tooling support

Types, Autocompletion.

Compile-time checking in editors.

Alles is *optioneel*. Je kunt altijd nog gewoon JavaScript gebruiken.

Onderdelen van een Component Class

imports

```
import { Component } from '@angular/core';  
import { DataService } from '../services/data-service';
```

annotations

```
@Component({  
  selector: 'orders',  
  directives: [DataService],  
  templateUrl: 'orders-component.html',  
})
```

class

```
export class OrdersComponent {  
  ...  
}
```

Checkpoint

- Angular 2 is een totaal ander framework dan Angular 1
- Component-based vs. Page-based
- Nieuwe syntaxis
- Nieuwe programmeertalen en andere nieuwe kenmerken
- Concepten komen – grotendeels – overeen
- Veel boilerplate-code nodig voor een Quickstart
- Daarna: niet meer naar omkijken. Concentreren op de componenten